

THE TECH

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PRICE THREE CENTS

TO MEET HANOVER TEAM TOMORROW.

DARTMOUTH GAME WILL BE FAST.

Both Teams to Have Five Veterans in Lineup.

Technology meets Dartmouth tomorrow at basket ball in one of the most important games of the season. The game will be at Hanover, in the Dartmouth Gym. The game Monday with Boston College seems to indicate that Tech has a very strong team this season, but the game cannot be taken as any final criterion of the work of the team.

Dartmouth has been a little slow in starting basket ball work this season, and as yet the team has not been put in very good shape. The individual work is good, but unity of action and team work are as yet undeveloped. There has been little scrimmage work this year and what there has been has been too elementary to give any indication of the ability of the team.

Five of last year's team are back at Dartmouth this season and should form a good nucleus for the present aggregation. Twenty-five other candidates have also been out for the team, and competition for places on it is most keen. Graduate coach H. R. Lane is in charge of the work this year, and he has had the team in hand for the last two weeks. Benjamin F. Lang 1909, is captain of the team.

Technology has been working without any regular coach, Captain Wentworth and Manager Whitmore being in charge of the daily practice. Since the game Monday there have been no changes in the lineup, and the same team will take the floor against the Hanover athletes. The team is having a much better chance to practice this year than ever before, and the effect is already showing in the character of the work. Although not quite so superior in individual work as the Dartmouth team the men have been working more concertedly and in the team play, Tech places most of its hopes of victory.

In the matter of veteran material both teams are even, each institution having five men back who played on the team last year. Each team has played but one game this year.

The lineup will be as follows:

TECHNOLOGY	DARTMOUTH
Cahill, rf,	Brady, lf
Hargraves, lf,	Morrissey, rf
Wentworth, c,	Lang, c
Nichols, rg,	Schindler, lg
Parker, lg,	Burns, rg

CORPORATION ANNOUNCES GIFTS.

\$6000 Addition To Bursar's Fund For Poor Students.

Gifts recently received were announced at the Corporation meeting on Wednesday. There is the \$6000 from the estate of Lyman F. Rhoads which was given under the condition that "this donation be invested and held as a permanent fund, the income of which shall be used for the assistance of poor students at the Institute, in the discretion of the Bursar, or such officer as at the time being exercise the duties now performed by the Bursar, but subject at all times to the approval of the President and Treasurer of the Institute."

This sum of money will put on a sound basis the fund that Bursar Rand has so long been striving to establish.

It was also announced that an additional \$1300 had been received from the estate of Thomas Gaffield.

A most interesting gift was that from Mrs. Mary G. Pickering for the promotion of the social and physical welfare of the students. The gift was \$500 to the President for expenditure where it would do the most good for the whole student body. Money from this sum will probably be used for the speakers at Convocations, for receptions and the like, and possibly for athletics.

INSTITUTE SHOULD HOLD TO ITS TRADITIONS.

PRES. NOYES SAYS IN ANNUAL REPORT THAT TECH SHOULD DEVELOP AS IN PAST AND SOLVE ATTENDANT PROBLEMS.

"Raise in Tuition Temporary." Dormitories Should be Built. Union and Gym Should be Larger. Conference System Urged for all Students.

To the Members of the Corporation:

I have the honor to present to you today a report upon the progress of the Institute during the preceding year, and upon the larger problems of development with which it is now confronted. In speaking of this matter of development, a person occupying only temporarily the office of the presidency naturally feels much hesitation; but I have believed that it would be of interest to you to hear the views of one who has for many years been a member of your Faculty; and I shall, therefore, venture to express myself freely upon our future policies. Let me, however, first recount to you briefly the history of the past year.

Changes in the Corporation.

The Corporation has during that period suffered the loss of one of its oldest members, Mr. Alexander S. Wheeler, whose services to the Institute give him a pre-eminent place among the many friends to whom it owes its foundation and development. He was a member of this Corporation from 1882 until the time of his death, and a member of the Executive Committee from the date of its formation until the year 1902. A fitting memorial of his services and of our appreciation and gratitude for his devotion is to be presented to you today by one of your members who was closely associated with him.

The Corporation has welcomed to its membership three new term members, elected from the nominees of the Alumni Association,—Dr. George E. Hale, of Pasadena, California, Mr. Geo. W. Kittredge, of New York City, and Mr. Frank G. Stantial, of Everett, Massachusetts.

There have been several changes in your administrative officers. Upon the first of last July, Dr. Henry S. Pritchett, after a service of seven years, retired from the presidency to devote himself to the work of the Carnegie Foundation for the Advancement of Teaching; and I was requested to perform the duties of the office till such time as a permanent president shall be appointed. Mr. George Wigglesworth upon the first of October resigned from the position of treasurer, which he has occupied since 1891. The eminent service which he has so freely and generously rendered to the Institute during this long period has been recognized, so far as words can do so, by the resolutions adopted at your last meeting; but every friend of this school has a deep-seated feeling of gratitude which can not be adequately expressed. The Institute is to be congratulated in having secured as its new treasurer Mr. Francis R. Hart, who brings to the work enthusiasm and intelligent devotion to the Institute and a wide financial experience. He becomes ex officio a member of your body and of your Executive Committee. At the annual meeting in October Mr. James P. Munroe was elected Secretary of the Corporation for the ensuing year.

Changes in the Faculty.

During the past year five members of the Faculty have withdrawn: Professor William O. Crosby, retiring under the Carnegie Foundation to devote himself exclusively to his geological investigations; Professor George V. Wendell, to take charge of the Department of Physics at the Stevens Institute of Technology; Professor Frank P. McKibben, to take charge of the Department of Civil Engineering at Lehigh University; Professor Richard W. Lodge, to devote himself to private practice; and Professor Douglas W. Johnson, to give all his time to his work at Harvard University as Assistant Professor of Physiography.

Within the Faculty advancements have been made from the grade of Associate Professor to that of Professor as follows: John O. Sumner, Professor of History; Frederick H. Bailey, Professor of Mathematics; Henry Fay, Professor of Analytical Chemistry.

The following men, formerly Assistant Professors, have been promoted to Associate Professorships:

Henry G. Pearson, Associate Professor of English;
Ralph R. Lawrence, Associate Professor of Electrical Engineering;
Harrison W. Smith, Associate Professor of Electrical Engineering;
George C. Shaad, Associate Professor of Electrical Engineering.

Thirteen new members have been added to the Faculty, of whom the four following have come to us from outside positions:

Reginald A. Daly, Professor of Physical Geology, formerly of the Geological Survey, Ottawa, Canada;

Edwin B. Wilson, Associate Professor of Mathematics, formerly of Yale University;

Lewis E. Moore, Assistant Professor of Civil Engineering, formerly of the University of Illinois;

Edward E. Bugbee, Assistant Professor of Mining Engineering and Metallurgy, formerly of the University of Washington.

The remainder were previously instructors at the Institute. They are as follows:

Leonard M. Passano, Assistant Professor of Mathematics;

George L. Hosmer, Assistant Professor of Civil Engineering;

Charles B. Breed, Assistant Professor of Civil Engineering;

Maurice DeK. Thompson, Assistant Professor of Electro-Chemistry;

Henry L. Seaver, Assistant Professor of English;

Miles S. Sherrill, Assistant Professor of Theoretical Chemistry;

George E. Russell, Assistant Professor of Civil Engineering;

Gilbert N. Lewis, Assistant Professor of Physico-Chemical Research;

Earle B. Phelps, Assistant Professor of Research in Chemical Biology.

Faculty Organization.

The Faculty has during the past year perfected its organization and has made provision for carrying on more effectively its administrative functions by the creation of the office of Chairman and by the appointment of new committees on Faculty Business, on Faculty Rules, and on the Courses of Instruction. In the report of the Secretary of the Faculty will be found not only a fuller presentation of these matters, but also certain resolutions of the Faculty in which its opinions are expressed as to the character of Faculty organization and the methods of administration best adapted to the conditions of the Institute. Our Faculty, like that of many other educational institutions, has now become so large that it can not properly deal with the details of administration; but instead of establishing a single administrative board consisting of a small number of its representatives, it has gradually developed the more democratic, and, we believe, the more effective, plan of placing its numerous and varied functions under the charge of about twenty-five standing committees which are empowered to take final action upon all special and individual cases that arise, and are expected to take the initiative in submitting to the Faculty for its approval any important changes of policy or procedure that seem desirable. I would especially call your attention to the resolution in which the Faculty, in response to the suggestion of President Pritchett, "expresses its appreciation of the desirability of some form of advisory relation between the Corporation and the Faculty, and its readiness to co-operate with the corporation in the preparation of a plan for establishing such a relation."

Registration and Other Statistics.

The membership of the Faculty has been increased from 78 to 86, and the number of instructors and assistants from 121 to 124.

The total registration of students is now 1410, while that at the same time last year was 1397. The proportion of Massachusetts students (55 1-2 per cent.)

(Continued on page 2.)

MISSION WORK IN LABRADOR.

DR. GRENFELL TELLS OF HIS WORK.

First Convocation Very Successful. Talk Followed Closely.

Labrador and the work of the Labrador Deep Sea Mission were the subjects taken up at the Convocation yesterday afternoon. The leader of the movement, Dr. Wilfred T. Grenfell, was the speaker.

In introducing him Dr. Noyes gave an excellent outline of his work and his achievement. He said:

"We are most fortunate in having with us today a man who stands pre-eminent among the world's workers for the high service that he has rendered to humanity. Picture to yourself an under-fed, half clothed people, without educational opportunities, without medical assistance, with only the crudest crafts, living in one of the most inhospitable regions of the earth, scattered along a barren coast a thousand miles in extent, where darkness and ice and storm prevail for a large portion of the year—a people plundered by unscrupulous foreign traders, and wantonly neglected by the government officials sent to care for them. Into this region in the spring of 1892 came a young English doctor without other resources than his own personal qualities and an indomitable resolution to uplift that hardy but unfortunate people. Year by year he fearlessly sailed up and down that perilous and uncharted coast through storm and fog and snow, in little vessels, often hardly seaworthy, facing hardship and danger and struggling against human prejudice, but steadily working toward the realization of his high aim. Success has come to him because he had one definite end in view and an unshaken purpose to attain that end."

In his talk Dr. Grenfell confined himself to a description of the conditions that he encountered in Labrador in the pursuit of his mission and gave a short account of the work that he has done. When a youth he had the good fortune to come across several men who had gained his respect because they were athletes and one of them was the most practical and common-sense preacher that he has ever heard. He said that he referred to Dwight L. Moody.

After he had become imbued with the idea that he wanted to do something for his fellow man he became interested in the conditions in Labrador. He wanted to do work there because in the first place there was a problem to solve. This, said Dr. Grenfell, is always interesting. Besides, the problem in this case was no easy one to solve. The men were accustomed to spend two or three days on land and then about eight or nine weeks at sea. When they were on land they fell victims to the saloons that stood open to them. The great majority of the men were God fearing people but the trouble lay in the fact that it was well nigh physically impossible for them to lead the life there that they knew they ought to live. His work lay in the direction of improving the conditions and making life as easy as possible.

In this line he has brought about better trade conditions, he has established four hospitals on the coast, and through the medium of the latter he has preached Christianity and right living. He has changed conditions so that now a drunken sailor is almost an unknown thing in the places where before the most vice flourished, and he has made the people realize what an unselfish life really means.

The men of the North Sea are different men today thanks to the work of Dr. Grenfell and his associates. They are not all ideal men but they are many of them men of high ideals. There are better homes in the fishing district, there are less women going to the poor house, and there are far less children going naked in the streets. These are the practical results that Dr. Grenfell has achieved.

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Friday, December 13, 1907.

THE REPORT OF THE PRESIDENT

Every student at the Institute should be vitally interested in the report of President Noyes. From it a man can better understand his true relations to the Institute.

Dr. Noyes mentions the following points:

Advisory relations are desirable between the Corporation and the Faculty.

The individual conference system should be extended to bring all students and instructors into personal contact.

It is advisable to divide students into sections according to their ability.

The departments ought to be given additional equipment and more floor space.

The Institute should continue as an undergraduate school and work along this line to the highest possible development.

Conditions in the Institute should be such that they produce not only well trained engineers but also broad-minded high-purposed men.

Advanced specialization should be restricted to fifth year work.

As a graduate school the Institute should aim to offer advanced training to Bachelors of Science rather than to Bachelors of Art.

To retain its educational prestige, the Institute must contribute to the advancement of science through research work.

To direct development, the Institute should have a permanent president.

In order that far reaching improvements may be made in physical conditions, the Corporation should decide on a permanent location.

The tuition should be less or at least there should be a reduced fee for first-year men.

To carry on improvements the Institute must have ample funds.

A more varied training in the first two years can be secured by the establishment of free summer schools.

For the welfare of the students, the Union and the Gymnasium should be larger.

Living expenses of the students could be reduced and their school spirit could be stimulated by the establishment of small dormitories.

By outside work the Instructing staff should keep the Institute in touch with the manufacturers and the community.

To encourage assistants and instructors in practical and experimental work, this work should be a requirement in promotions and in all departments research laboratories should be formally organized.

SHOULD HOLD TO ITS TRADITIONS.

(Continued from page 1.)

is nearly the same as last year. The number of foreign students has increased from 76 to 80, now forming 5.7 per cent. of the whole. The proportion of new students who have previously attended other colleges has increased from 19 per cent. five years ago to 29 per cent. the present year. There is no very marked change in the distribution between the several courses. The three largest courses are as in the past those in Mechanical, Civil, and Electrical Engineering, with 226, 210, and 200 students, respectively. Next comes the Course in Mining Engineering and Metallurgy with 118 students, showing this year an increase of 18 students, the largest in any course. The average age of students entering the first year is 18 years 11 months, one month greater than last year.

Other interesting statistical information will be found in the report of the Registrar.

Developments in Instruction.

The history of the past year will be found recorded in some detail in the reports of the general administrative officers and of those in charge of departments, which are submitted with this report. To these I invite your special attention. I can speak here only of the more important developments; and first, I will mention those relating to the work of instruction.

The curricula of all the strictly engineering courses have been modified during the past two years by the omission, wholly or in part, of the second year work in modern languages; and the time gained has been utilized to increase the amount of instruction in English and history, and to give a more thorough drill in fundamental engineering subjects, especially in applied mechanics, structures, and steam engineering. It is felt that few engineers make practical use of their knowledge of modern languages, and that the general and scientific studies that have been substituted are not only more directly useful, but either have a higher cultural value or provide a better mental training.

Important progress in the direction of more advanced work has been made by greatly extending and systematizing the subjects of instruction offered to candidates in fifth-year courses leading to the degree of Master of Science. Almost every department has announced, and is prepared to offer in the next school-year, advanced courses of a somewhat more specialized character in the different fields of applied science and engineering. Thus in civil engineering further work in the design of structures (particularly those of re-enforced concrete), of railroads, and of hydraulic works, is offered; in mechanical engineering, further study of turbine and gas engines and of machine design is provided for; in architecture, advanced courses in the various branches of architectural design are announced; and similarly in all other departments advanced work has been arranged for. The broad significance of this form of development and its bearing on the character of our undergraduate courses I shall speak of later.

To graduates from other colleges a special inducement to pursue such advanced work has been offered by a recent vote of the Faculty, which permits them to enter at once upon a course leading to the degree of Master of Science without previously taking our Bachelor's degree. This course will in general extend over a period of two or three years, varying according to the previous preparation of the college student.

There are no developments of any kind which are so important as those which tend to increase the effectiveness of our undergraduate instruction in meeting the needs of the individual student. I am glad to be able to tell you that this year an important step in this direction has been taken by the initiation of a plan of individual conferences between the instructor and students in certain first-year subjects. Owing to the inadequacy of the funds available for the purpose—for it involves additional instructors of first-rate ability—it has been possible this year to put this plan in force only to a limited extent in the subjects of English and mathematics. It is, I believe, of great importance that this plan be largely extended as rapidly as our facilities admit; for it is undoubtedly true that many of the students who now fail to reach our standards, could overcome many of their difficulties if they could receive more help in learning how to study and more personal encouragement and stimulation. The conference plan also develops an attitude of cordiality and mutual helpfulness both in the instructing staff and the student body which is the essence of a healthy college spirit.

The instruction in the department of mathematics is undergoing a somewhat radical revision, in which the old divisions into advanced algebra, analytic geometry, differential and integral calculus are being in large measure obliterated, and the whole subject is being presented, irrespective of this traditional grouping, in a manner most economical and advantageous for the student, and with the help of a large number of concrete applications.

The Department of English is trying the interesting and apparently successful experiment of dividing its students into sections upon the basis of their proficiency. This makes it possible to give instruction better adapted to individual needs; on the one hand, it avoids holding back the brighter students, and on the other, it makes it possible to help more effectively those who need it most. A trial of this plan in other subjects of instruction seems advisable.

(Continued on page 3.)

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REPORT OF THE ACTING PRESIDENT

SHOULD HOLD TO ITS TRADITIONS.

(Continued from page 2.)

Needs of the Departments.

The immediate needs of the various departments should not pass unnoticed by me, even though they are more fully presented in the separate reports of those in charge.

Nearly all of the departments are in serious need of additional floor-space for laboratories, class-rooms, and places for students to study. The demand for better laboratory accommodations is perhaps most urgent in the Departments of Mechanical Engineering, Mining Engineering, and Chemistry. In the first of these departments some additional provision must be made at once in order that the recently purchased steam turbine and its accessories may be installed; and in the Chemical Department the much larger number of students who will take organic chemistry next year, owing to changes in the course schedules, can not be accommodated with the present facilities.

Additional equipment is also much needed by several departments. Some of the larger and most essential machines are as follows: a surface condenser, refrigerating plant, and impact tester are important to the Department of Mechanical Engineering, additions the need of which has been strongly urged by your visiting committee; new engine and speed lathes and other machines, as well as extensive repairs to the building are required by the laboratories of Mechanical Arts; a large storage battery is greatly needed by the Electrical Engineering Department; and a new boiler for the heating and power plant is essential before the beginning of the next school year.

Educational Field of the Institute.

It is well, I believe, for the Corporation to take under consideration from time to time those fundamental principles which express the main purposes for which the Institute exists and which should determine the educational field which it is to occupy and the directions in which it is to be developed. In this belief, I here present my views for your consideration.

Should Continue as an Undergraduate School.

First of all, I believe that all those connected with the Institute should clearly recognize that one of its main functions, as an independent scientific school, is to educate for the scientific and engineering professions young men who have previously received only a high-school education. It must remain in large measure a school for undergraduates, and must not allow itself through the influence of the policies of universities to become a graduate school for the professional training of the graduates or former students of other colleges. The question here at issue is not which is more advantageous—a professional training preceded by a liberal education of an elective character or a co-ordination of the two in a single prescribed course, but whether or not there is a large field for education of the latter type. Some may prefer to drive tandem, with a loose rein upon the leader, and some to drive abreast; but none wishes his freedom of choice restricted. By the establishment in this community of the Graduate School of Applied Science at Harvard University, and by a similar development at other universities throughout the country, ample provision will doubtless be made, as fast as the demand arises, for the engineering education of college graduates. It should be, on the other hand, the special care of the Institute to maintain and develop that combination of liberal and professional training for undergraduates for which it has stood from its foundation. If ever there should cease to be a demand for this type of education, or if ever it shall have been demonstrated that this type when properly developed produces only engineers and scientists of an inferior grade, then, and not till then, will it be time to consider the conversion of the Institute into a purely graduate school. To abandon at this stage the educational experiment which the Institute is making, instead of coping with the difficulties in its problem which have become apparent, would be a betrayal of the trust which its past imposes and a severe blow to the educational development of this country. There is as yet no indication that the sources that have directly fed the streams which are inundating our technological schools are drying up, nor is there as yet any adequate experience which warrants us in diverting those streams into a different channel. It is certainly desirable that the new type of engineering education be developed, in which cultural subjects are given as collegiate courses and the professional training in a graduate school;

but this is not our field of educational service. Such a development is to be welcomed in part because it is a stimulus to us to study the conditions for making our own type of education more effective. We must therefore not allow our attack upon the problems of undergraduate education to be weakened by theories as to the tendencies of professional education under university conditions, nor by inconclusive comparisons between the results attained in graduate schools of law and medicine and those that may be expected in similar schools of applied science.

Should both Train and Broaden.

The second principle which I desire to emphasize is that already indicated by my preceding words, namely, that as an independent undergraduate school the educational problem of the Institute is necessarily of a two-fold character: for we have to develop a plan of education which is adapted to produce not only well-trained engineers, but also broad-minded, high-purposed men. We must aim to make the work of the students at the Institute and the conditions of their life outside such as lead to a duly proportioned development in these two directions.

It is sometimes said, however, that in attempting to solve this two-fold problem in a four-year undergraduate course, the Institute is undertaking a hopeless task. This contention I would meet by the statement that, whether or not it be hopeless to give a fully adequate education upon these two sides within the period of four years, it is our problem to do this in as large a measure as is possible; for to further increase this minimum period of study would close the doors of the institutions of technological education to a large number of young men whose financial resources are already taxed to the utmost. Moreover, the careers of Institute graduates in the past warrant the conclusion that the results attained in the past are as a whole satisfactory; and when the many possibilities of further development in the educational work and the conditions of student life are considered, the future outlook for a fuller success of the four-year course is a bright one. Before conceding the necessity of an extension of this period of study, we must at least consider the possibility of utilizing in part the intermediate summer vacations which now cover no less than one-third of the whole year; but to this matter I shall return when I come to consider the specific lines of development which are most imperative.

Should Specialize in a Fifth Year.

The general principle which should determine the character of our four-year course of study—and this is fully recognized by our Faculty,—is that a liberal education be provided such as will develop character, breadth of view, and high ideals of service, and that the professional education be mainly confined to a thorough training in the principles of the fundamental sciences and in scientific methods, specific engineering subjects being only so far included as the remaining time permits and as the minimum requirements of professional practice demand. It should be our aim not to turn out at the end of a four-year course a specialist, but rather to provide for specialization in a fifth-year graduate course. By courageously eliminating from our fourth-year curriculum the most technical branches of instruction, however important they may be for the practising engineer, and by making more ample provision for them as subjects to be pursued in graduate courses, we shall, on the one hand, be able to make our undergraduate course more educational in the broadest sense, and, on the other hand, make more evident to the student the practical importance of returning for a fifth year to acquire the more specialized knowledge of the separate engineering professions. This, then, is the direction in which, in my judgment, the courses of study at the Institute should be developed; we will give in our four-year undergraduate course an even broader and deeper training than at present in cultural and fundamental scientific studies—a training which will still enable those students that are obliged to do so to enter at once upon the practice of their professions, handicapped somewhat, it may be, by the lack of technical experience, but with a sound knowledge of principles and a developed mental power which will gradually enable them to overcome this disadvantage; and, on the other hand, we will develop graduate courses of such a character as will obviously remedy this deficiency of insufficient specialization and will attract such graduates of scientific schools as are financially able to continue their education. We shall thus create a type of graduate school in which is offered ad-

vanced training for Bachelors of Science rather than for Bachelors of Arts.

But this is by no means the only function which the Institute should fill. It must aim to be the leader in the development of all grades of higher scientific and technological education, of which the mathematical, physical, and natural sciences form the main basis, exceptions only being made in cases, like those of medicine and agriculture, where ample provision has already been made by another class of institution. Some of the other directions in which our development must be continued or extended therefore deserve consideration.

We must, while not permitting any sacrifice of the instruction of our undergraduate students, encourage college graduates to enter the higher years of our regular courses and our advanced courses, and offer them such additional facilities as their different preparation demands. Future experience alone can determine whether such graduates will receive a better education in the graduate schools of universities in courses attended often not only by themselves but by college men without definite professional aim, or in scientific schools working side by side in the undergraduate courses with men earnestly devoted to preparation for their profession. The presence together of these two groups of men is certainly mutually advantageous: the graduate student from another institution tends to broaden the interests of his undergraduate associates; and the latter imbues the former with the spirit of hard work and seriousness of purpose which attendance at the scientific school has inspired. For these reasons we must not fail to provide suitable courses and conditions of work for the college graduates who are coming to us in constantly increasing numbers.

Need for Research Work.

Development is also of the greatest importance in the direction of larger opportunities and inducements for research work and advanced studies in the pure and applied sciences which form the basis of our curriculum. An institution of learning which does not contribute through the researches of its instructing staff and graduate students to the advancement of science can not secure the highest grade of teachers, can not keep its courses of instruction upon the plane of broad and deep scholarship, and can not retain its educational prestige. I have already spoken of one kind of advanced courses which we are already developing—one which would provide the more specialized instruction in engineering subjects which industrial advances are making more and more imperative. Such a course, which hardly needs to be of more than one year's duration, leads to the degree of Master of Science. There is, however, a second kind of advanced course which is even more essential to the development of the highest type of scientist or engineer. This is a course in which the student, while pursuing more advanced studies in the underlying sciences, devotes himself mainly to the original investigation of problems in pure or applied science. It is investigation work of this sort which tends to develop the creative power of the man and his ability to handle new problems relating to the improvement of industrial processes and engineering methods. Such a course, when of two or three years' duration, may lead to the degree of Doctor of Philosophy or Doctor of Engineering. The Institute has already made encouraging progress in this direction; but the number of students engaged in such work has thus far been small. This matter of research work, both with reference to advanced students and the members of our own instructing staff, I shall consider more fully a little later.

The Larger Problems of Development.

Let me next speak of what may be called the larger problems of development—of those lines of action which are essential to the fuller accomplishment of our educational purposes.

It is scarcely necessary to mention that one of the most important of these problems is the selection of a permanent president who has a true conception of the educational ideals of the Institute, combined with the high character, soundness of judgment, and power of initiative and of energetic execution, that will make him an effective agent in the realization of those ideals. The qualifications for the office are so numerous and varied that their combination in a single person is extremely rare; and all such persons are in great demand for the highest executive positions. With the consideration of this matter the Executive Committee is still actively engaged.

Permanent Location.

Another matter of the greatest mo-

ment is the reaching of a decision as to the permanent location of the Institute, in order that its future development may be assured and its immediate needs adequately provided for. I shall not, however, discuss this question; for I know that you fully realize its vital significance. You have appointed a Committee of your body to deal with it; and that Committee will doubtless take action and report to you as promptly as possible. It will of course be appreciated that the first preliminary to any action must be a careful consideration of the means for financing the undertaking; and that the present monetary situation makes this impracticable. Friends of the Institute should, however, realize that again in its history the time has arrived when provision must be made for far-reaching improvements in the physical conditions under which its work is carried on. New buildings must be erected, new laboratories provided, and new equipment secured, in order that the Institute may retain its leadership in technological education. And these are not matters that can be much longer deferred.

Need for Reduced Tuition.

Next in importance to this matter of making provision for our immediate needs and future development comes the question of reduced tuition fees or increased scholarship aid. The inadequacy of our endowment combined with the high cost of the kind of instruction furnished by the Institute, made it seem necessary a few years ago to increase our tuition fee to \$250—an amount which exceeds by one hundred dollars the fee charged at any other scientific school in New England. This increase will, I earnestly hope, be regarded as only a temporary expedient for which a remedy must be found at the earliest moment. The present high tuition not only is shutting out a large group of the most promising young men from the advantages of a scientific and engineering education, but is imposing upon another large group, or upon their parents, a financial burden which they are scarcely able to bear, and which forces such students to live and to work under conditions unfavorable to their health and social development. Any of the administrative officers of the Institute could recount numerous instances where the unanticipated need of purchasing a military uniform or a set of drawing instruments or some expensive book has been the last straw added to the financial load of the overburdened student, where men have been obliged to withdraw from the Institute because they could not raise the last fifty dollars of their tuition, or where they have been living on thirty or forty cents a day in order to meet it. Our high tuition is, moreover, sending young men more and more to the other less expensive institutions. Many of these take the full courses of study there, but there is a large and increasing number who for reasons of economy replace the first year or first two years of the Institute course by corresponding work at another institution and then enter the second or the third year of the Institute. There is involved in this plan a lack of continuity and of adequate preparation which is unfortunate. While we are not interested in bringing about any large increase in the number of our students, we are concerned in drawing to us young men of the highest quality. We must, therefore, not permit the financial resources of applicants to be the principle of elimination in any greater measure than is absolutely essential. There is, in my opinion, no form of educational expenditure which produces so large a return to the community as the higher training for the scientific and engineering professions of those comparatively few young men whose character and ability are such as to enable them to rise to positions of leadership. And this type is, I believe, most commonly developed among families which have sufficient means to send their sons to the high school, but yet are obliged to make them work at odd times to earn money towards their own support. Boys from poorer families are, unfortunately, not likely to have the opportunity of even a high school education, or the home surroundings or antecedents which conduce to intellectual development, while those from richer families are apt to lack the earnestness of purpose and inclination to subordinate the pursuit of pleasures to thorough preparation for a life of service which is acquired by the boy who has already learned to work. It is, however, just such families of small means which find it exceedingly diffi-

REPORT OF THE ACTING PRESIDENT

cult, if not impossible, to meet the high expense of technological education. This expense includes, it must be remembered, not only the high tuition fee, but many other items not involved in collegiate courses of study, such as charges for laboratory apparatus, drawing instruments, and expensive scientific books.

Reduced Fee for First-Year Men.

This difficulty may be met in either of two ways—a general reduction of our tuition fee or provision for larger funds for scholarship aid to individual students. Under the existing conditions a combination of the two methods seems most advisable. To reduce our tuition fee for all our students would involve such a large reduction of our income that it probably cannot be immediately considered; but it might be practicable to adopt the plan of reducing the tuition fee from \$250 to \$200 for first-year students. Assuming a first-year class of 330 students, this would involve a decrease of \$16,500 in our annual income; but this might be partly offset by the increase which it would probably cause in the number of first-year students. The advantages of this reduction in tuition for first-year students are proportionally far greater than a corresponding reduction for those of the higher years—desirable as the latter is. It would enable a larger number of properly prepared students to enter the Institute; and the most deserving of these, after they had demonstrated their ability by their first year's work, could be assisted to continue by grants from our scholarship funds and those of the State, which can not be awarded with proper discrimination to boys in advance of their coming to the Institute. Moreover, as the student gets older and has had more training, it is easier for him to get remunerative employment in the summer vacations. It will, too, diminish the tendency for students to go to other institutions for a single year or two, merely for reasons of economy. Finally, it is the most equitable, and from a financial standpoint, the safest one for the Institute to pursue in effecting a reduction of its tuition charges, since the first year instruction is less costly than the more specialized instruction of the higher years. This plan would, however, remedy only in part the difficulties of our high tuition; for our scholarship funds are not adequate to meet the needs of our deserving students in the higher years. This is fairly evident merely from the statement that the scholarship grants to undergraduate students formed last year only nine per cent. of the total tuition fees paid by them. Ampler funds must therefore be secured either through an appeal to the generosity of private donors or through further grants from this Commonwealth, which can not afford to allow the opportunity of a higher technological education to remain closed to such of its young men as are fully qualified to receive it.

I come now to matters more closely related to the work of instruction and involving, fortunately, less difficult financial problems—matters which are, however, of the greatest importance to our development.

Free Summer Schools.

First of all I would bring to your attention the extension of the required work of the Institute courses for a period of four or five weeks into the summer. Such an extension can best be made, not by lengthening our present term, but by providing summer schools which our regular students are required to attend, and to which they will be admitted free of charge, in the summers at the end of the first two school-years. The importance of this extension of our regular work can be fully appreciated only by those who are intimately acquainted with the difficulties and defects of our present system of instruction; but the main aspects of this matter can be readily understood. The educational problem of the Institute, as has already been stated, is to give to students with only a high-school preparation a liberal education, a thorough training in fundamental scientific subjects, and sufficient technical knowledge to enable them to enter at once upon the practice of their profession. Under the present conditions, as I have already said, we must attempt to do this as far as possible in a period of four years; at any rate an unconditional requirement of a fifth year seems to me unwarranted until the opportunities of the four-year period have been fully utilized. Our summer vacations form one-third of the whole year; and during this time most of our younger students are unoccupied or are

at work in places from which they derive no educational advantage. The assignment of even four or five weeks of the summer vacations after the first and second years, to those portions of our work which consist largely in the acquirement of technical skill and experience, such as laboratory practice, shop work, drawing and work in the field and in industrial establishments, would so relieve the present overcrowded curriculum that an amount of good entirely out of proportion to the time gained could be accomplished. The time gained would, I am sure, be devoted by the Faculty not to further specialization in the engineering branches, but to some increase in general studies and to more thorough training in the fundamental principles of the sciences underlying the professional work. The attempt would be made to concentrate the attention of the student upon fewer subjects at one time, to demand more thought and less learning of lessons, and to emphasize important principles through the solution of numerous problems by the student. This would tend to remedy the tendency, sometimes spoken of, of the Institute student to work too much and think too little. The pressure of the studies of the school year would be somewhat diminished; while the work of the summer school, being largely in laboratory, shop, or field, and concentrated upon one or two subjects, would not continue the mental strain to any great extent. The plan would involve increased expense to the Institute; for it would be necessary to pay the salaries of the instructors engaged in the summer schools for an additional month. Aside from this, the only important objection to it seems to be the added tax that it imposes upon the resources of certain students in forcing them to meet the expenses of living in Boston for a longer period and in shortening the time which they can devote to remunerative work. This makes it, in my opinion, out of the question to charge an additional tuition fee for such required summer courses; but is not a sufficient argument for postponing a step which is so essential to the effectiveness of our work.

Student Welfare.

The problem of the outside activities of our students are, I believe, in the main solving themselves satisfactorily under the guidance of the administrative officers of the Institute. To our last President, Dr. Pritchett, is due in large measure the development of the conditions that make for a broader and fuller student life. His establishment of the Tech Union, which is the center of the social activities of students, his promotion of a rational system of athletics, his interest in the appointment of a Dean of the Faculty, his institution of general convocations of students at which they are addressed by distinguished speakers, and other results of his own personal participation in student affairs, form a most worthy and enduring memorial of his services to the Institute. Credit for the progress in this direction must also be given to our Dean and Bursar. The work of the former, as the general consulting officer for students, and of the latter in his sympathetic administration of his financial office and his effective management of the Tech Union, and the participation of both in the social gatherings of students have done much to develop a loyal, manly, democratic spirit such as exists in few colleges.

The Tech Union, great as are the benefits which it has brought to our student life, is, however, miserably inadequate as the social gathering place of our fourteen hundred students; and the same is true of the present temporary gymnasium as a means of providing for their physical welfare. One of the strong reasons for a prompt decision as to our future location is that the Walker Memorial Building can then be at once erected, whereby suitable social and dining halls and a properly equipped gymnasium will be provided.

Plan for Small Dormitories.

There is, however, also a need of some provision for the housing of those of our students who can not live at home or with friends, or in fraternity houses. Perhaps one-fifth of the whole body of students live in undesirable surroundings in cheap boarding houses, where opportunities for student fellowship and for the development of a healthy social life do not exist. I strongly dissent from the view sometimes expressed that our obligations to the young men who spend with us four of the most critical, formative years of

their lives are solely on the intellectual side; and the situation I have just mentioned is one, I think, for which we must soon find a remedy. It is one, too, which is especially appropriate for the Corporation and Alumni to deal with directly. In attacking this problem, it is desirable to proceed slowly and in an experimental way. A plan that might be followed is one which the Dean has suggested—the plan of erecting two or three student houses, each accommodating twenty-five to thirty students, upon the Institute's vacant land in Brookline, adjoining the Athletic Field. The establishment of large dormitories accommodating a hundred or two hundred students does not offer a satisfactory solution of the problem; for there is a lack of the close fellowship and of the *esprit de corps* which is developed in smaller compact groups. The Greek letter fraternities have demonstrated the type of student associations which is attractive to young men. These have been extensively developed here during the past ten years, and, whatever may be true of them in the atmosphere of the college campus, they are, on the whole, successful with the earnest kind of student who attends the Institute. The fraternity houses, however, owing to the large expense connected with the maintenance of such isolated private houses in the city, fail to provide for many of the students who most need such social opportunities as they afford. In buildings erected upon Institute land in the suburbs, it should be possible, with proper financial management, to provide board and room at a cost of six dollars a week, which would be within the means of a much larger proportion of our students. There is every reason to believe that, with the interest in this undertaking already shown by the Dean and certain members of the Corporation, the Alumni, and the Faculty, this experiment would be successful.

Should Keep in Touch with the Community.

An extension of opportunities for investigation both in pure and applied science by members of our staff and by advanced students is a matter which, though secondary to the considerations directly affecting the instruction and general welfare of undergraduate students, is nevertheless of the greatest importance in its effect on the relation of the Institute to the scientific and technical development of this country. It ought to be the especial aim of the Institute to get into the closest touch with the scientific problems of the manufacturer and the community, and to assist in the solution of them—as is being done by the universities and agricultural colleges of the Western states. Professors and instructors on our staff are already doing a vast amount of work in this direction, partly through the thesis work of students, and partly through their employment as experts. But this work is often performed under conditions which make a thorough-going investigation impossible; and, because of its personal character, it fails to be identified with the Institute and recognized among its contributions to scientific progress. In my opinion, we should in all departments give each of our assistants and instructors a reasonable proportion of free time for research purposes, we should afford him adequate laboratory facilities, and should then insist as a condition of his promotion and advancement in salary that he have made and published scientific or technical investigations. Almost all our instructors already have some available time that could be devoted to research work, so that the carrying out of this suggestion does not involve a proportionate increase in our staff. That time is, however, at present so limited, so disconnected, and so apt to be encroached upon by other work that the man feels little encouragement to enter upon an investigation. If that amount of time could be increased, and made definite by the assignment of days or half-days for research work, there would result not only an incalculable gain to himself as a teacher, investigator, and scholar, but also added reputation to the Institute because of its larger contributions to science.

Benefit of Research Laboratories.

Another method of promoting investigation work at the Institute is through the establishment of research laboratories in connection with the departments. For each such laboratory an income of about \$5000 needs to be guaranteed for at least a few years. Two laboratories have already been started which are devoted to research in physical chemistry and in sewage disposal,

and their contributions to pure science in the one case and to questions of municipal sanitation in the other have attracted much attention throughout the country. The Departments of Chemistry and Geology have recommended two new laboratories of this kind,—a Research Laboratory of Applied Chemistry and a Research Laboratory of Physical Geology,—the former to be devoted to the study of chemical problems of general importance to the manufacturer, and the latter to the investigation of geological processes and disturbances of economic significance. The Departments of Applied Mechanics and Mechanical Engineering are also in need of research assistants to carry on more systematically such investigations as have long been in progress and to prepare the results for publication. The formal organization of research laboratories accomplishes much more than the same expenditure of money for uncorrelated investigations by the individual members of the departments. It calls attention to the activity of the Institute in this field, raises its scientific standing, attracts advanced students, who are often just as effective research workers as inexperienced assistants, offers facilities and inducements for advanced study and investigation to our younger instructors, and forms a nucleus of development in this important direction. I recommend that the Visiting Committees of the Departments give this matter their attention.

Conclusion. Special Committees.

I might go on to discuss some of the more specific developments which it is desirable for the Institute to introduce, such as better provisions for training teachers in those branches of science and engineering with which we are most closely identified, definite arrangements for offering our professors leave of absence in the sabbatical years, or for a half-year in every four, and the like; but I have already made too great a demand on your attention. In closing, permit me, however, to make one further suggestion. From my conversations with members of the Corporation I know that many of them earnestly desire to be of greater assistance to the Institute through closer contact with its work. I believe now that a great service might be rendered if special committees were appointed to promote of the various lines of development to which I have alluded in this report. You have already appointed a Committee on the Site. It might be well to appoint also a Committee for the Promotion of the Welfare of the Students, which could deal with the question of student houses, with other plans for enlarging their social, cultural, and physical life, and with further provision for scholarship aid to alleviate the hardships imposed by our high tuition. Still another Committee might be appointed for the Promotion of the Work of Instruction. This Committee would consider such matters as the extension of the personal conferences between instructors and students, the introduction of required summer work in the undergraduate courses, provision for research work by the junior members of the instructing staff, and enlargement of the scope of instruction in any desirable direction, it being understood that any such plan of educational development shall have first received the endorsement of the Faculty. These committees should, I believe, be in the closest relations with the Executive Committee with reference to all questions involving financial arrangements or radical changes of policy, and with the officers and committees of the Faculty in all matters relating to the work of instruction or to the interests of students. They should frequently hold joint meetings with the representatives of the Faculty, thereby establishing the closer contact with that body which is so desirable. They should attempt to provide for the realization of such improvements as seem to them advisable, and to that end should be given the necessary authority. The development of plans might well receive preliminary consideration in these committees alone, final actions of importance being taken in joint session with the Executive Committee, in order to secure the proper correlation between the work of the different representatives of the Corporation. I recommend, however, that the appointment of such committees be deferred till the permanent president has been appointed, in order that he may participate from the start in the important work which they would undertake.

ARTHUR A. NOYES.

December 11, 1907.

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COMMUNICATION.

To Penn Men,
The fall smoker of the New England
Alumni Association of the University
of Pennsylvania will be held at 7.30
tonight at the American House, Hanover
St.
The occasion will be absolutely in-
formal and we want every Penn man
in this vicinity to be present. Annual
election of officers will be held at this
smoker instead of at the annual ban-
quet which takes place February, 1908.
Communicate at once with
W. RAY BALDWIN, Secretary.
650 Tremont Bldg., Boston.

DR. MANN TELLS WHY MEN FAIL.

Also Praise: Dr. Grenfell's Work.

In his talk to the Y. M. C. A. yester-
day, Dr. Mann said: "There has been
a lot of talk lately about men in high
positions failing to do their duty. They
do not realize that they are stewards,
and when a strain comes, or a tempta-
tion, not even public opinion can keep
some men straight; and this is the
greatest force in the world next to
faith in God."

Dr. Mann said of Dr. Grenfell: "He
is not an orator, but a very simple
speaker. He will tell you about his
work in Labrador. Dr. Grenfell took up
this work because it was the hardest
thing he could find to do for Christ."

DEAN BURTON MEETS FRESHMEN.

"Drawing as a language" was the
subject of Dean Burton's talk to the
freshmen on Wednesday afternoon. The
Dean pointed out the great importance
of drawing in every branch of engineer-
ing, illustrating his talk by lantern
slides of drawings made by cave dwell-
ers and the ancient Egyptians on stone
and ivory. Some of the bones from
which the photographs were taken are
estimated to be over 12,000 years old.

COLLEGE PRESS MEN DINE TONIGHT.

New England College Papers at Smoker.

The New England Intercollegiate
Press Association will hold its annual
smoker this evening at the Copley
Square Hotel. There will be a supper
followed by talks and discussion.

The speakers will be Edward Stan-
wood, Editor The Youth's Companion, on-
magazine publication; F. B. Sibley, Bos-
ton Globe, on editorial writing; Harold
Walter Lovett, Advertising Agent, on
advertising and circulation; and Frank
Gorham, Boston Globe, on news writ-
ing.

There will be representatives present
from all the local papers including the
Tufts, Harvard, Boston College and
Boston University papers. THE TECH
will send a number from its board.
There will be present editors from the
boards of the Trinity Tripod, Williams
Record, Amherst Student, Bowdoin
Orient, The Dartmouth and probably
The Brown Daily Herald, the Worcester
Journal and several others.

The officers of the association this
year are President, Henry Wm. Hoole,
editor-in-chief of THE TECH; secre-
tary-treasurer, Arthur L. Robinson,
editor-in-chief of The Bowdoin Orient;
executive committee, W. G. Smith, edi-
tor of The Bates Student.

FIELD LOCKER ROOM OPEN TODAY.

An opportunity will be given today
to any who may wish to do so to get
into the locker room at the field and get
out clothes or other material that they
may want to have before the opening
of the track season in the spring. The
occasion will be the opening of the field
house on account of the Interscholastic
run which will take place today starting
from the field.

This run is to be given under the aus-
pices of the M. I. T. cross country asso-
ciation. It will start from the field
at 3.30 o'clock. Most of the schools
around Boston have entered and team
and individual prizes will be given.

ATHLETES ATTENTION!



In order to ob-
tain the best
results in athletic
contests, it is im-
portant that you
should have the
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They may cost
a trifle more, but
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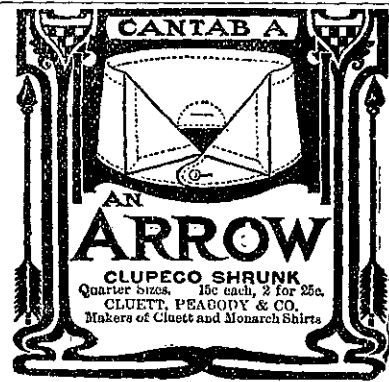
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CALENDAR.

Friday, December 13.

4.15 P. M. Mandolin Club Rehearsal in 31 Rogers.

5.00 P. M. Candidates for Gym Team Report at the Gym.

7.30 P. M. Southern Club Meeting at the Union.

Saturday, December 14.

1.00 P. M. 1911 Relay Picture at Jordan's Studio, 288 Boylston St.

3.00 P. M. Weekly Run Starts from the Gym.

8.00 P. M. Basket ball; Tech vs. Dartmouth, at Hanover.

Monday, December 16.

8.00 P. M. Catholic Club Meeting at Boston College Catholic Association House, East Newton Street.

4.00 P. M. Glee Club Rehearsal at the Union.

4.00 P. M. Mandolin Club Rehearsal in 31 Rogers.

6.30 P. M. Musical Clubs Start on Lynn trip from Boylston St. Subway Station.

FACULTY NOTICE.

The class in argumentation and debate will meet today at 4.00 P. M., in 26 Rogers. The subject of the debate is: Resolved, That Japanese labor should be excluded from the United States. Students are invited to attend.

NOTICES.

1911.—Relay Team meet Saturday at 1.05 sharp at Jordan Studio, 288 Boylston St., for pictures. Bring suit. The field locker will be open this afternoon.

GYM TEAM.—Candidates for gym team meet today at 5 P. M. at the Gym. A joint exhibition with the B. Y. M. C. A. is to take place about the middle of January, so it is important to start work as soon as possible.

CATHOLIC CLUB.—Meeting tomorrow evening at the Boston College Catholic Association house, East Newton Street.

EPISCOPALIANS.—All Episcopalians are urged to be present at the corporate communion to be held at Trinity Church Sunday morning at 9 o'clock and at the meeting to be held Sunday night at 8 o'clock in the rectory, 233 Clarendon St. right behind Walker building.

MUSICAL CLUBS.—Members of the musical clubs will meet for Lynn trip Monday evening at 6.30 on the north-bound platform, Boylston Street subway station.

CLASSIFIED ADS.

Advertisements of this kind under different classifications are inserted at the rate of five cents a line, averaging six words to a line, payable in advance.

FOUND.—A slide rule. Inquire at the Bursar's office.

FOUND.—Slide rule, sweater, gloves, umbrella and several other articles have been found recently. Owners will please call for them at the Bursar's Office.

WANTED.—1st and 2nd Tenors for professional work. Only men with experience need apply. Leave card, showing free hours, at Cage, marked "Quartet."

WANTED AT ONCE.—Agents for the Red Dwarf Ink Pencil. Apply any noon at Room 30, Rogers.

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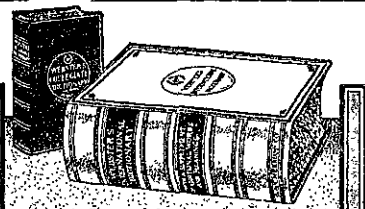


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